REMARKS/ARGUMENTS

Claims 12 and 13 remain in the application. Claims 11, 14, 15, 16 and 18 have been amended. Claim 17 has been cancelled. No new matter has been added.

Claim 17 objected to as being a duplicate of claim 13, has been cancelled, its limitations have been moved up into independent Claim 15.

Reconsideration of the rejection of Claims 11-18 under 35 U.S.C. 112 first paragraph, as containing matter which was not described in the specification in such a was as to reasonably convey to one skilled in the relavant art that the inventor(s) at the time the application was filed, had possession of the claimed invention, is requested, in light of the following arguments.

In Claims 11, 14, 15, and 18 the term "cohesive coatings" was replaced with "adhesive coatings" . In Claims 11 and 15, the limitation "intermittently changing said pressure of said pressure regulated gas supply for generating a turbulent vertical agitation" was removed to reflect the written description of the invention.

The rejection of Claim 16 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, is requested, in light of the following argument.

Dependence of Claim 16 has been changed from Claim 11 to Claim 15 in response to the Examiner's kind suggestion.

Reconsideration for the allowance of Claims 11-18 under 35 U.S.C. 103(a) as being unpatentable over Advocate, Jr. et al. (U.S. 5,904,156) in view of Molinaro (U.S. 5,082,518), and further in view of JP11-121419 is requested, in light of the following arguments.

Briefly, applicants wish to point out the claimed invention which is a novel and cost-effective process for stripping and cleaning organic coatings. The removal of residual adhesive materials from sidewalls formed in etched metallic layers of dense submicron topography on semiconductor substrates. Cleaning is accomplished to a plurality of substrates contained in a substrate carrier and immersed in a liquid chemical by intermittently changing a gas pressure causing a wave of turbulent bubbles that egress from the bottom of the substrate carrier to the top while scrubbing the surfaces of the substrates.

While Advocate et al. teaches a method of removal of a film of photoresist, which can be utilized in semiconductor technology and particularly for the removal of photoresist from the vicinity of C4 structures. Advocate's method is directed towards stripping photoresist from a substantially planar object with C4 structures as opposed to the cleaning of organic residue from pockets and sidewalls which are analogous to narrow spaced and deep walled canyons.

Reasonable expectation of success

While Molinaro teaches a gas diffusion system for evenly distributing injected gas in a bath wherein gas manifold is connected/welded to a flat quartz plate having sized holes for evenly spreading and distributing the gas bubbles throughout the treatment liquid. Molinaro specifically indicates that quartz has material integrity and can have appropriate surface finish to maintain it as inert to the chemicals being used. The inventors agree with Examiner Kornakov regarding Molinaro's choice of using quartz because of its inert properties. This indeed was a wise choice, however, the most telling difference, of the invention, is a flexible tubing, that is also inert, inserted into a sinuous groove in the quartz gas distribution plate and holes drilled into the flexible tubing using drill guide holes provided in the gas distribution plate. This gives the user, of the invention, a method to select a range of stepped drills that can be used to drill smaller diameter holes in the flexible tubing.

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not claimed

JP11-121419 relates a treatment for etching or cleaning semiconductor wafers in a tank containing a heated solution of quaternary ammonium hydroxide while being intermittently bubbled by an ozone-containing gas

Ref ex is moot

This contrasts with the claimed invention in which a method for removing adhesive materials from substrates as claimed in amended Claim 11 and 15, lines 1-15 and 29-43 which claims a method for removing adhesive coatings from a plurality of substrates having dense submicron topography containing prominent sidewalls, comprising the steps of: placing a quartz gas distribution plate, connected to a pressure

regulated gas supply, in an open tank containing a liquid chemical; submerging and placing a substrate carrier, containing a plurality of substrates, on said quartz gas distribution plate so that said substrates are aligned and in a vertical position relative to said quartz gas distribution plate; said distribution plate directs gas bubbles between and parallel to each surface of said substrates aligned thereabove, providing a chemical-mechanical scrubbing;

removing said substrate carrier from said chemical liquid.

The method of claims 11 and 15 , and the manner as illustrated in Figs. 2 are neither taught nor suggested by the prior art.

We have reviewed the related art references made of record and have determined that none of these suggest the present claimed invention.

Attached hereto is a marked-up is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned.

"Version with markings to show changes made."

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please amend the claims as follows:

11. (AMENDED) A method for removing [co]adhesive coatings from a plurality of substrates having dense submicron topography containing prominent sidewalls, comprising the steps of:

placing a quartz gas distribution plate, connected to a pressure regulated gas supply, in a tank containing a liquid chemical;

submerging and placing a substrate carrier, containing a plurality of substrates, on said quartz gas distribution plate so that said substrates are aligned and in a vertical position relative to said quartz gas distribution plate;

[intermittently changing a pressure of said regulated gas supply for generating a turbulent vertical agitation,] said quartz distribution plate directs gas bubbles between and parallel to each surface of said substrates aligned thereabove, said [turbulent vertical agitation] gas bubbles providing a chemical-mechanical scrubbing;

removing said substrate carrier from said chemical liquid.

14. (AMENDED) The method according to claim 11 wherein using a quartz gas distribution plate is compatible with aggressive chemicals for removing [co]adhesive residues in metal sidewalls that are coated with polymer.

15. (AMENDED) A method for stripping [co]adhesive photoresist from a

plurality of semiconductor wafers having dense submicron topography containing prominent sidewalls, comprising the steps of:

horizontally placing a quartz gas distribution plate, connected to a pressure regulated nitrogen gas supply, in an open tank containing a photoresist stripping chemical;

submerging and placing a wafer cassette containing a plurality of wafers on said quartz gas distribution plate so that said wafers are aligned and in a vertical position relative to said quartz gas distribution plate;

[intermittently changing said pressure of said pressure regulated gas supply for generating a turbulent vertical agitation,] said distribution plate directs [gas] nitrogen bubbles between and parallel to each surface of said wafers aligned thereabove, said [turbulent vertical agitation] nitrogen bubbles providing a chemical-mechanical scrubbing;

removing said wafer cassette from said photoresist stripping liquid.

16. (AMENDED) The method according to claim [11]15 wherein said quartz gas distribution plate having gas distribution means for generating an array of nitrogen bubbles, each row of said array corresponding to a wafer position contained in said wafer cassette.

PLEASE CANCEL CLAIM 17.

18. (AMENDED) The method according to claim [11] 15 wherein using a

quartz gas distribution plate is compatible with aggressive chemicals for removing [co]adhesive residues in metal sidewalls that are coated with [co]adhesive photoresist.